



SEQUENCE LISTING

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TECH CENTER 1600/2900

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BAUDU, Philippe

<120> CANINE HERPESVIRUS BASED RECOMBINANT LIVE VACCINE, IN
PARTICULAR AGAINST CANINE DISTEMPER, RABIES OR THE
PARAINFLUENZA 2 VIRUS

<130> 454313-2200.1

<140> 09/596,479

<141> 2000-06-19

<150> 09/213,053

<151> 1998-12-16

<150> 9608242

<151> 1996-06-27

<150> PCT/FR97/01115

<151> 1997-06-23

<160> 31

<170> PatentIn Ver. 2.1

<210> 1

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<212> DNA

<213> Canine herpesvirus

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<211> 398

<212> PRT

<213> Canine herpesvirus

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Asp Asn Val Cys Gly Glu Ile Leu Lys Thr Tyr Lys Lys Leu Glu Lys
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Cys Glu Pro Ile Asn Ile Leu Ser Ala Arg Trp Ser Ser Leu Val Asn
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Thr Pro Lys Leu Cys Tyr Lys Leu Cys Val Asn Leu Ile Arg His Leu
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Gly Phe Pro Tyr Val Asn Val Ser Asp Met Glu Ala Asp Asp Val Cys
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Ala Asn Leu Tyr His Thr Asn Thr Ala Ala Gln Ile Tyr Thr Thr Asp
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Thr Asp Leu Ile Leu Met Gly Cys Asp Ile Ile Leu Asp Val Val Pro
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Leu Phe Pro Pro Thr Leu Arg Cys Arg Asp Ile Leu Ala Ser Leu Asn
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Lys	Tyr	Lys	Asn	Ser	Lys	Lys	Glu	Tyr	Asn	Ser	Asp	Ser	Gly	Asp	Ser	180	185	190	
Ser	Glu	Glu	Ser	Gly	Glu	Ile	Gln	His	His	Glu	Lys	Tyr	Leu	Asp	Gln	195	200	205	
Ile	Ser	Asn	Ser	Trp	Arg	Ile	Ser	Asp	Ser	Val	Ser	Thr	Asn	Ile	Val	210	215	220	
Ser	Ser	Ser	Glu	Glu	Ser	Ser	Asn	Ile	Thr	Ser	Ser	Glu	Ser	Ser	Asp	225	230	235	240
Thr	Asp	Ser	Phe	Gly	Ile	Pro	Lys	Asn	Gln	Asn	Gly	Phe	Lys	Ile	Leu	245	250	255	
Ser	Lys	Ile	Asn	Ser	Pro	Ser	Asn	Lys	Gly	Gln	Ser	Lys	Arg	Val	Thr	260	265	270	
Ala	Val	Asp	Glu	Asn	Ser	Leu	Asn	Leu	Lys	Tyr	Thr	Ser	Arg	Phe	Pro	275	280	285	
Pro	Ile	Met	Lys	Thr	Ile	Ser	Arg	Ser	Leu	Met	Met	Leu	Pro	Ala	Pro	290	295	300	
Gln	Thr	Lys	His	Glu	Val	Leu	Glu	Arg	Lys	Phe	Ile	Lys	His	Leu	Thr	305	310	315	320
Asn	Met	Ile	Thr	Pro	Glu	Tyr	Arg	Gly	Glu	Asn	Leu	Ser	Ile	Ile	Lys	325	330	335	
Arg	Val	Pro	Ile	Ile	Gln	Glu	Lys	Phe	Asp	Ile	Asn	Leu	Val	Tyr	Glu	340	345	350	
Thr	Leu	Leu	Ser	Phe	Ile	Asp	Asp	Lys	Glu	Lys	Ala	Lys	Asn	Leu	Thr	355	360	365	
Asn	Leu	Phe	Trp	Lys	His	Ile	Ser	Ile	Pro	Ile	Asp	Tyr	Asn	Leu	Val	370	375	380	
Leu	Ile	Ser	Tyr	Trp	Asp	Asp	Ser	Lys	Ser	Arg	Arg	Trp	Val			385	390	395	

<210> 3

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<212> PRT

<213> Canine herpesvirus

<400> 3

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Asn Val Ile Lys Thr Asn Leu Val Tyr Lys Lys Lys Leu Leu Thr Phe	35	40	45
Ser Leu Asn Leu Asn Phe Tyr Phe Leu Lys Phe Leu Leu Phe Cys Leu	50	55	60
Val Phe Lys Ala Met Ala Cys Phe Arg Pro Lys Thr Glu Phe Lys Ile	65	70	75
Thr Asn His Pro Ser Gln Ile Ile Asn Asn Glu Glu Asn Ile Asn Ser	85	90	95
Glu Glu Gly Lys Phe Ile Ser Gly Arg Ala Val Leu Glu Asp Gln Lys	100	105	110
Leu Arg Asp Val Ile Ser Met Leu Thr Pro Phe Ser Thr Ser Leu Lys	115	120	125
Asn Ser Phe Ile Val Phe Ser Asp Tyr Gly Met Met Ile His Thr Ser	130	135	140
Ile Cys Gly Glu Gln Ile Tyr Ile Pro Ile Ser Lys Asn Gln Phe Ser	145	150	155
Ser Tyr Phe Trp Gly Tyr Ser Asp Pro Ala Val Phe Leu Ala Asn Val	165	170	175
Asp Ser Lys Arg Gly Leu Leu Asp Val Phe Lys Ser Thr Ser Lys Met	180	185	190
Ser Lys Val Phe Phe Glu Ile Ser Asn Pro Ser Gln His Arg Met Leu	195	200	205
Lys Gln Val Ile Phe Thr Ile Ser Asp Ser Asn Ile Lys Cys Ser Thr	210	215	220
Leu Leu Lys Ala Glu Phe Ser Asn Tyr Cys Ile Met Leu Pro Ser Arg	225	230	235
Asn Pro Asp Phe Ser Leu Glu Leu Asn Lys Tyr Gln Leu Asn Lys Ile	245	250	255
Leu Glu Leu Asn Lys Lys Gln Asn Ser Leu Leu Lys Phe Glu Ser Asn	260	265	270
Glu Asn Asn Val Val Ile Ser Ser Glu Ser Gly Ser Val Ser Leu Asn	275	280	285
Leu Asp Arg Ser Asp Ser Glu Gly Glu Asp Ser Ala Ser Ile Leu Lys	290	295	300
Ser Ala Thr Lys Lys Val Asn Pro Tyr Leu Val Lys His Ser Glu Asn			

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 Pro Ile Gly Ile Ile Leu Phe Phe Phe Cys Thr Asn Glu Leu Gln His
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 Lys Ser Leu Lys Arg Pro Ala Ser Pro Ser Asp Glu Glu Lys Pro Pro
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 Asn Ile Lys Pro
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 <213> Canine herpesvirus

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 65 70 75 80
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 85 90 95
 Ile Cys Arg Ile Ser Gln Ser Ile Phe Val Thr Ile Ala Ala Phe Cys
 100 105 110
 Trp Gly Phe Asp Trp Ile Leu Asn Pro Ile Ala Ile Lys Ile Ile Leu
 115 120 125
 Ile Leu Ser Leu Ser Phe Leu Thr Ile Cys Thr Ile Lys Ile His Ile
 130 135 140

Phe Tyr Leu Ile Ser Ile Leu Asn Gly Ser Gly Ser His Val Lys Gly
145 150 155 160
Ser Leu Val Thr Ile Leu Phe Gly Thr Ile Leu Gly Val Phe Gly Thr
165 170 175
Leu Asn Val Ile Lys Ile Glu Ile Leu Ile Gly Phe Gly Ile Ala Leu
180 185 190
Cys Ile Ile Leu Ser Asn Thr Asn Phe Gly Leu Val Ile Arg Asp Thr
195 200 205
Cys Tyr Tyr Arg Ile Gly Arg Tyr Lys Leu Met Arg Thr Phe Thr Asp
210 215 220
Leu Gly His Gly Ala Ser Tyr Ser Ile Glu Glu Asp Glu Thr Ser Asp
225 230 235 240
Tyr Ser Glu Ile His Glu Arg Lys Ile Ser Ser Phe Gln Leu Ile Tyr
245 250 255
Lys Tyr Pro Ser Met Ile Ile Ile Ser Ile Leu Gly Phe Met Leu Thr
260 265 270
Ile Ala Ile Trp Gly Leu Asn Val Tyr Leu Lys Asn Leu Lys Phe His
275 280 285
Ser Pro Phe Thr Leu Val Ile Ser Phe Ile Val Gly His Cys Leu Ala
290 295 300
Phe Leu Val Glu Pro Phe Asn Tyr Lys Ile Lys Cys Ile Ser Arg Ile
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325 330 335
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340 345 350
Thr Ile Ser Leu Val Ser Leu Leu Tyr Ile Arg Lys Gln Thr Gln Gly
355 360 365
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<213> Canine herpesvirus

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Ile	Thr	Lys	Pro	Ile	Ser	Thr	Glu	Ala	Asn	Asn	Leu	Lys	Ser	Val	Ser
	50					55					60				
Thr	Ser	Ile	Lys	Pro	Pro	Lys	Asn	Leu	Lys	Lys	Lys	Leu	Leu	Lys	Ser
65					70					75					80
Lys	Cys	Arg	Asp	Asn	Val	Ile	Tyr	Arg	Pro	Tyr	Phe	Ser	Gln	Leu	Glu
				85					90					95	
Ile	Asn	Cys	Thr	Ile	Thr	Lys	Lys	Gln	Asn	Leu	Ser	Asn	Pro	Leu	Ile
			100					105					110		
Glu	Leu	Trp	Phe	Lys	Glu	Leu	Ser	Thr	Tyr	Asn	Lys	Thr	Asn	Glu	Asn
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 35 40 45
 Ile Leu Leu Thr Ile Ala Ala Ile Ile Phe Thr Phe Ile Phe Thr Val
 50 55 60
 Pro Leu Glu Met Leu Gly Ser Ile Asn Cys Pro Pro Ser Thr Phe Gly
 65 70 75 80
 Ile Asp Asn Val Cys Ile Glu Pro Ile Lys Lys Ser Ile Asn Ser Tyr
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110

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<210> 8
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<210> 9
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<210> 10
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<210> 12

<211> 36

<212> DNA

<213> Artificial Sequence

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<223> Oligonucleotide JCA075 used for preparation of plasmid pPB202

<400> 12

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<210> 13

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide JCA076 used in PCR reaction to obtain 1030 bp fragment

<400> 13

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<210> 14

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide JCA077 used in PCR reaction to obtain 1030 bp fragment

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<210> 15

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide JCA078 used for preparation of plasmid pPB204

<400> 15

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<210> 16
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<212> DNA
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<400> 16
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<210> 17
<211> 36
<212> DNA
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<220>
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<400> 17
ggagatctag taaattaaat agtaattcat ttaatg 36

<210> 18
<211> 33
<212> DNA
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<220>
<223> Oligonucleotide JCA081 used in PCR reaction to obtain 720 bp fragment

<400> 18
cagtcgcgaa gatgaaaata aaatccatcg aag 33

<210> 19
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<223> Oligonucleotide JCA082 used to prepare plasmid pPB206

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<210> 20
<211> 34
<212> DNA
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<400> 20

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<210> 21

<211> 32

<212> DNA

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<223> Oligonucleotide JCA084 used in PCR reaction to obtain 1837 bp fragment

<400> 21

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<210> 22

<211> 28

<212> DNA

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<210> 23

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<212> DNA

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<223> Oligonucleotide PB088 used in PCR reaction to obtain 244 bp fragment

<400> 23

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<223> Oligonucleotide JCA086 used in PCR reaction to obtain 2011 bp fragment

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<210> 27
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<210> 29
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<210> 30
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<213> Artificial Sequence

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<223> Oligonucleotide JCA091 used in PCR reaction to obtain 1597 bp fragment

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<210> 31

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<212> PRT

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Asn Val Ile Lys Thr Asn Leu Val Tyr Lys Lys Lys Leu Leu Thr Phe
35 40 45

Ser Leu Asn Leu Asn Phe Tyr Phe Leu Lys Phe Leu Leu Phe Cys Leu
50 55 60

Val Phe Lys Ala Met Ala Cys Phe Arg Pro Lys Thr Glu Phe Lys Ile
65 70 75 80

Thr Asn His Pro Ser Gln Ile Ile Asn Asn Glu Glu Asn Ile Asn Ser
85 90 95

Glu Glu Gly Lys Phe Ile Ser Gly Arg Ala Val Leu Glu Asp Gln Lys
100 105 110

Leu Arg Asp Val Ile Ser Met Leu Thr Pro Phe Ser Thr Ser Leu Lys
115 120 125

Asn Ser Phe Ile Val Phe Ser Asp Tyr Gly Met Met Ile His Thr Ser
130 135 140

Ile Cys Gly Glu Gln Ile Tyr Ile Pro Ile Ser Lys Asn Gln Phe Ser
145 150 155 160

Ser Tyr Phe Trp Gly Tyr Ser Asp Pro Ala Val Phe Leu Ala Asn Val
165 170 175

Asp Ser Lys Arg Gly Leu Leu Asp Val Phe Lys Ser Thr Ser Lys Met
180 185 190

Ser Lys Val Phe Phe Glu Ile Ser Asn Pro Ser Gln His Arg Met Leu
195 200 205

Lys Gln Val Ile Phe Thr Ile Ser Asp Ser Asn Ile Lys Cys Ser Thr
210 215 220

Leu Leu Lys Ala Glu Phe Ser Asn Tyr Cys Ile Met Leu Pro Ser Arg
 225 230 235 240
 Asn Pro Asp Phe Ser Leu Glu Leu Asn Lys Tyr Gln Leu Asn Lys Ile
 245 250 255
 Leu Glu Leu Asn Lys Lys Gln Asn Ser Leu Leu Lys Phe Glu Ser Asn
 260 265 270
 Glu Asn Asn Val Val Ile Ser Ser Glu Ser Gly Ser Val Ser Leu Asn
 275 280 285
 Leu Asp Arg Ser Asp Ser Glu Gly Glu Asp Ser Ala Ser Ile Leu Lys
 290 295 300
 Ser Ala Thr Lys Lys Val Asn Pro Tyr Leu Val Lys His Ser Glu Asn
 305 310 315 320
 Phe Lys Arg Leu Lys Phe Arg Trp Met Ile Ile Pro Ile Phe Phe Pro
 325 330 335
 Leu Leu Lys Lys Leu Lys Leu Thr Asn Thr Thr Val Ser Ile Asn Phe
 340 345 350
 Phe Phe Thr Pro Thr Thr Asn Pro Met Ile Ser Leu Thr Ser Ser Lys
 355 360 365
 Pro Ile Gly Ile Ile Leu Phe Phe Phe Cys Thr Asn Glu Leu Gln His
 370 375 380
 Lys Ser Leu Lys Arg Pro Ala Ser Pro Ser Asp Glu Glu Lys Pro Pro
 385 390 395 400
 Lys Ile Gln Cys Gly Phe Phe Ser Gln His Phe Val Asn Thr Asp Val
 405 410 415
 Asn Ile Lys Pro Met Ser Leu Glu Asp Asn Asn Val Gln Ser Phe Asp
 420 425 430
 Gln Leu Glu Pro Pro Ile Thr Ser Phe Ser Ile Ile Asn Cys Ser Gly
 435 440 445
 Ser Arg Pro Gly Cys Leu Pro Cys Met Tyr Val Thr Thr Lys Ser Leu
 450 455 460
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 465 470 475 480
 Ile Gln Ile Leu Thr Glu Ser Phe Val Cys Ser Ile Ile Leu Ile Ala
 485 490 495
 Thr Val Leu Ile Phe Thr Leu Ser Lys Ile Ser Ile Ser Thr Ser Glu
 500 505 510
 Lys Ile Ser Ser Ile Cys Arg Ile Ser Gln Ser Ile Phe Val Thr Ile
 515 520 525

Ala Ala Phe Cys Trp Gly Phe Asp Trp Ile Leu Asn Pro Ile Ala Ile
 530 535 540
 Lys Ile Ile Leu Ile Leu Ser Leu Ser Phe Leu Thr Ile Cys Thr Ile
 545 550 555 560
 Lys Ile His Ile Phe Tyr Leu Ile Ser Ile Leu Asn Gly Ser Gly Ser
 565 570 575
 His Val Lys Gly Ser Leu Val Thr Ile Leu Phe Gly Thr Ile Leu Gly
 580 585 590
 Val Phe Gly Thr Leu Asn Val Ile Lys Ile Glu Ile Leu Ile Gly Phe
 595 600 605
 Gly Ile Ala Leu Cys Ile Ile Leu Ser Asn Thr Asn Phe Gly Leu Val
 610 615 620
 Ile Arg Asp Thr Cys Tyr Tyr Arg Ile Gly Arg Tyr Lys Leu Met Arg
 625 630 635 640
 Thr Phe Thr Asp Leu Gly His Gly Ala Ser Tyr Ser Ile Glu Glu Asp
 645 650 655
 Glu Thr Ser Asp Tyr Ser Glu Ile His Glu Arg Lys Ile Ser Ser Phe
 660 665 670
 Gln Leu Ile Tyr Lys Tyr Pro Ser Met Ile Ile Ile Ser Ile Leu Gly
 675 680 685
 Phe Met Leu Thr Ile Ala Ile Trp Gly Leu Asn Val Tyr Leu Lys Asn
 690 695 700
 Leu Lys Phe His Ser Pro Phe Thr Leu Val Ile Ser Phe Ile Val Gly
 705 710 715 720
 His Cys Leu Ala Phe Leu Val Glu Pro Phe Asn Tyr Lys Ile Lys Cys
 725 730 735
 Ile Ser Arg Ile Ile Leu Ile Ile Cys Leu Leu Leu Glu Leu Ile Ala
 740 745 750
 Ser Leu Ile Ser Val Leu Gly Leu Asn Phe Gly Ser Pro Leu Ile Leu
 755 760 765
 Thr Thr Thr Thr Thr Ile Ser Leu Val Ser Leu Leu Tyr Ile Arg Lys
 770 775 780
 Gln Thr Gln Gly Val Asn Arg Leu Ala Ala Thr Tyr Ile Ser Arg Ala
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 Leu Ile Ile Gly Leu Tyr Met Thr Val Gly Ile Cys Tyr Ile Phe Ile
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 Lys Thr Ile Asn Met Ser Phe Lys Asn Phe Tyr Leu Ile Tyr Val Ile
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Ile	Ile	Phe	Ile	Asn	Ser	Ile	Ile	Thr	Ser	Ala	Ser	Thr	Ser	Lys	Pro	
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		850						855						860		
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Lys	Ser	Val	Ser	Thr	Ser	Ile	Lys	Pro	Pro	Lys	Asn	Leu	Lys	Lys	Lys	
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Ser	Gln	Leu	Glu	Ile	Asn	Cys	Thr	Ile	Thr	Lys	Lys	Gln	Asn	Leu	Ser	
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Asn	Pro	Leu	Ile	Glu	Leu	Trp	Phe	Lys	Glu	Leu	Ser	Thr	Tyr	Asn	Lys	
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Thr	Asn	Glu	Asn	Val	Glu	Ser	Leu	Lys	Thr	Asp	Ile	Ser	Lys	Asn	Ile	
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Leu	Leu	Phe	Ser	Thr	Lys	Asn	Asn	Ser	Asp	Asn	Phe	Tyr	Asn	Asp	Phe	
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Gln	Phe	Tyr	Asp	Asn	Gly	Asn	Ile	Leu	Leu	Asn	Ile	Lys	Ser	Val	Asp	
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Phe	Lys	Thr	Ser	Gly	Ile	Tyr	Thr	Trp	Lys	Leu	Tyr	Asn	Ser	Asn	Asn	
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Glu	Ser	Ile	Phe	Glu	Thr	Phe	Lys	Ile	Gln	Val	Tyr	Ala	Tyr	His	Ser	
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Pro	Asn	Val	Asn	Leu	Lys	Ser	Asn	Pro	Ser	Leu	Tyr	Asn	Glu	Asn	Tyr	
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Ser	Ala	Ile	Cys	Thr	Ile	Ala	Asn	Tyr	Phe	Pro	Leu	Glu	Ser	Thr	Glu	
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Ile	Phe	Trp	Phe	Asn	Asp	Gly	Gln	Pro	Ile	Asp	Lys	Lys	Tyr	Ile	Asp	
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Glu	Thr	Tyr	Ser	Val	Trp	Ile	Asp	Gly	Leu	Ile	Thr	Arg	Thr	Ser	Ile	
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Leu	Ser	Leu	Pro	Phe	Ser	Glu	Ala	Met	Glu	Ser	Pro	Pro	Asn	Leu	Arg	
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Cys	Asn	Val	Glu	Trp	Tyr	Lys	Asn	Ser	Lys	Ala	Ser	Lys	Lys	Phe	Ser	
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Phe Asp Asn Gly Leu Ala Ile Cys Asp Ala Lys Cys Val Ser Arg Glu
1155 1160 1165

Asn Asn Lys Leu Gln Trp Leu Val Lys Asp Ile Pro Ile Asn Gly Asp
1170 1175 1180

Asp Ile Ile Ser Gly Pro Cys Leu Asn His Pro Gly Leu Val Asn Ile
1185 1190 1195 1200

Gln Asn Lys Ile Asp Ile Ser Asp Tyr Asp Glu Pro Val Thr Tyr Lys
1205 1210 1215

Cys Ser Ile Ile Gly Tyr Pro Ile Ile Phe Pro Asn Phe Tyr Asp Glu
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Lys Val Phe Asp Ala Ser Asp Glu Asn Val Ser Lys Ser Met Leu Ile
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Ser Ile Thr Thr Ile Ile Gly Gly Ala Ile Phe Val Ile Val Leu Ile
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Phe Ile Thr Ala Leu Cys Phe Tyr Cys Ser Lys Asn Asn Lys Ile Met
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Ala Gln Leu Val Leu Thr Asp Ile Pro Leu Glu Asp Val Glu Asn Lys
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Asn Thr Ser Ser Asp Glu Glu Thr Thr Asn Leu Asn Gln Lys Lys Ser
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Thr Cys Gln Cys Leu Cys Val Thr Leu Gly Phe Phe Ala Ala Gly Ile
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Leu Glu Met Leu Gly Ser Ile Asn Cys Pro Pro Ser Thr Phe Gly Ile
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Asp Asn Val Cys Ile Glu Pro Ile Lys Lys Ser Ile Asn Ser Tyr Ser
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Glu Leu Ser Lys Ile Cys Tyr Asp Arg Leu Ser Asn Pro Ile Asn Gln
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Ser Thr